EXHIBIT 8

Water Quality Data Report No. 6 (of 6)

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Bozeman, MT 59715

February 3, 1995

COPY

Mr. Pat Plantenberg
Department of State Lands
Hardrock Mining Bureau
1625 Eleventh Avenue
Helena, Montana 59620

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Dear Pat:

Enclosed are two copies of Water Quality Data Report No. 6 summarizing the results of the second post-reclamation water sampling data at the W.R. Grace vermiculite mine near Libby. Data for this report was collected September 19, 1994. Please forward one copy of the report to Tom Reid at the Water Quality Bureau for their files.

The data for this report are similar to that we have been reporting in previous reports. If you recall, our last report was the first that showed all data below the values for the drinking water standard including the analyses for asbestos and fluoride, the two components which have historically been above or near the drinking water standard. For the latest sampling, we collected one sample from Lower Rainy Creek with asbestos at about 25.0 million fibers per liter (MFL). The standard is 7 MFL. However, our replicate sample was from this same location and analyzed only 4.6 MFL. The asbestos analysis has always shown less reproducibility between replicate samples than the other analyses but this is poorer agreement than we're used to seeing. So, there is some question regarding the analysis or sampling for this particular sample. In any event, the data does not change any of the basic conclusions we have drawn regarding asbestos in Lower Rainy Creek.

The fluoride analysis was also up slightly in the tailings dam toe drain sample after showing a trend of slowly declining values. However, I note that the drinking water standards were updated in July, 1993 and the standard for fluoride was one of those that changed. The new standard is 4.0 mg/L F. All of our samples have been below this value since we began sampling in 1991.

If you have any questions regarding the report please call. Our next planned sampling event is in the fall of 1995. At that time we would like to review the status of the water quality in the study area to determine whether continued monitoring will be required.

Sincerely,

Tom Hudson

Tom Hudson
Project Manager

Shelf

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W.R. GRACE VERMICULITE MINE CLOSURE WATER QUALITY DATA REPORT NO. 6 SEPTEMBER, 1994

Submitted to:

Montana Department of State Lands
Hard Rock Mining Bureau
Helena, Montana

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FEB 06 1995
STATE LANDS

Submitted by:

Schafer and Associates
Bozeman, Montana

February 3, 1995

Schafer

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1.0 BACKGROUND

The W.R. Grace vermiculite mine near Libby, Montana was closed in the fall of 1990. As part of the reclamation and closure, particularly as it applies to areas around the tailings impoundment, W.R. Grace submitted to the Water Quality Bureau a proposed Water Quality Monitoring Plan in September, 1991 (Schafer and Associates, 1991). The purpose of the Plan was to establish post-closure water quality data as a means of monitoring the performance of facility reclamation measures.

The plan called for water sampling at several locations in the Rainy Creek drainage as shown on Figure 1.1. Contingent sampling on the Kootenai River was proposed if initial data on Rainy Creek indicated a significant potential health concern. Four sampling campaigns were proposed for the first year to characterize pre-reclamation water quality conditions and assess seasonal variations in water quality. Additional annual sampling campaigns for a minimum of three years following closure were also proposed. The first sampling event took place in mid-November, 1991, the second in late March, 1992, the third in early July, 1992 and the fourth in late October, 1992. Results from these pre-reclamation sampling events were reported in Water Quality Data Report No.1, No. 2, No.3 and No. 4, respectively (Schafer and Associates, 1992 a,b,c and 1993). Data from these sampling events indicated that fluoride was slightly above the drinking water standard in effect at that time (2.0 mg/l F) in the tailings dam toe drains. However, drinking water standards were updated in July, 1993 and the standard for fluoride was one of those that was changed. The new standard is 4.0 mg/l F, a value which has never been exceeded in any of the samples taken to date.

Asbestiform fibers were also above drinking water standards in Lower Rainy Creek. Although Carney Creek carried fibers potentially attributable to mine waste dumps and Fleetwood Creek carried fibers which appear to be of natural origin, neither tributary could account for the quantity of fibers found in Lower Rainy Creek. It was concluded that the Lower Rainy Creek streambed was the source of the high asbestiform fiber count and that this was probably the result of old mining practices which discharged tailings directly into the drainage without prior settlement.

Facility demolition and reclamation activities were completed in 1992 and early 1993. In October of 1993 the first of the post-closure water sampling campaigns was completed. That sampling event produced the first occasion for which all samples including fluoride and asbestiform fibers were lower than the drinking water standard. This report is the second of the post-closure water quality reports summarizing data from water samples collected September 19, 1994.

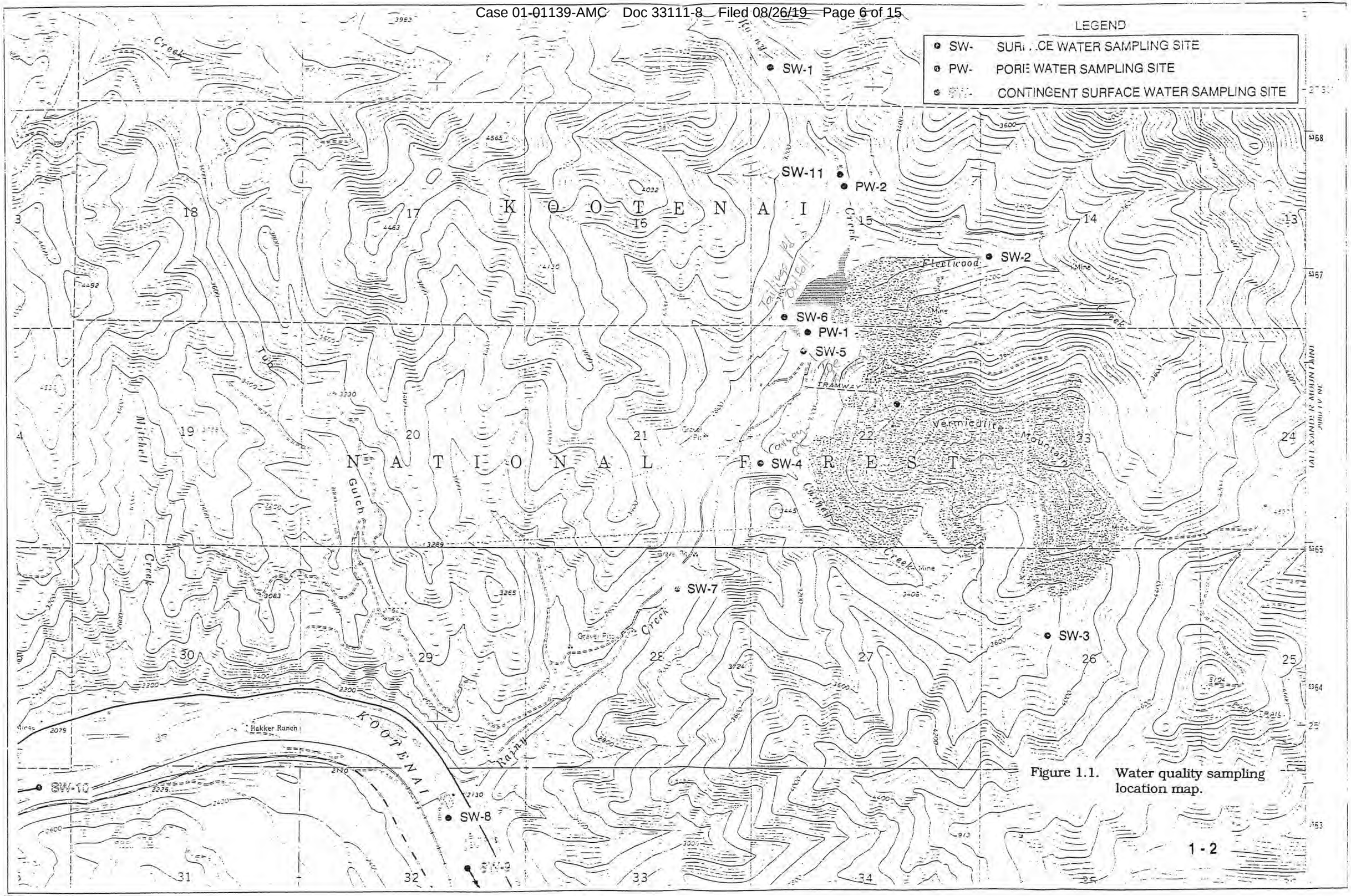

Figure 1.1. Water quality sampling location map.

2.0 METHODS

Weather at the time of sampling was partly cloudy and mild. Temperatures ranged from 65° F to 85° F. The tailing pond surface water was restricted to the upper half of the impoundment. At the time of sampling there was no surface water discharge from the impoundment through the new concrete spillway which was built in the spring of 1993. However, W.R. Grace personnel reported that there was sufficient spring runoff for the channel to flow briefly earlier in the year.

Sampling methods were outlined in the Water Quality Monitoring Plan (Schafer and Associates, 1991) submitted in September, 1991 and modified slightly in the field as described in Water Quality Data Report No. 1 (Schafer and Associates, 1992). For the post-closure sampling, modifications were made to the initial plan to reduce the number of samples and the analyses performed on them based on the results of baseline sampling. These changes were outlined in a letter to DSL dated January 13, 1992 accompanying Water Quality Data Report No. 4. The revised sampling plan concentrated on the fluoride and asbestiform fibers in Lower Carney Creek, toe drains and surface discharge from the tailings impoundment, and Lower Rainy Creek. Since elevated metal concentrations were not detected in baseline sampling, metal analyses were removed from the analytical list. DSL agreed to the suggested changes and recommended that annual post-closure sampling take place each year in the fall of the year during base flow.

During the past year the routing of Carney Creek was altered to divert its flow into the small pond below the tailings impoundment. This pond was previously used as a reservoir for a process water pump station. Carney Creek had been flowing into a small sediment trap, then through a culvert into Rainy Creek just below the reservoir. The rerouting required that the sampling location for Lower Carney Creek (SW-4) be relocated upstream about 100 feet.

The preservation techniques and analytical methods used are summarized in Table 2.1. All samples were stored and shipped on ice.

Table 2.1. Summary of sampling and analytical methods for water samples.

Unpreserved Samples		Field Parameters	
Component	**Analytical Method[1]**	**Parameter**	**Method**
TDS	EPA 160.1	Flow	Pygmy current meter/ Baski flume
TSS	EPA 160.2	pH	Field pH meter
Asbestiform Fibers	EPA-600/4-83-043	EC	Field EC meter
Hardness	EPA 130.2	Temperature	Field meter
Alkalinity	EPA 310.1		
NO_3^{-1}	EPA 353.2		
SO_4^{-2}	EPA 375.3		
Cl^{-1}	EPA 325.3		
F^{-1}	EPA 340.2		
Ca	EPA 215.1/200.7		
Mg	EPA 242.1/200.7		
Na	EPA 273.1/200.7		
K	EPA 258.1/200.7		
CO_3^{-2}/HCO_3^{-1}	EPA 310.1		

[1] EPA procedures are described in 40 CFR Part 136, Table B. Procedures for asbestiform fibers are described in "Analytical Procedures for Determination of Asbestos Fibers in Water" (EPA-600/4-83-043).

3.0 PRESENTATION OF DATA

Results of the September 19, 1994 sampling are summarized in tabular form as follows:

- Table 3.1 is a summary of field parameters including pH, electric conductivity (EC), temperature and flow.
- Table 3.2 is a summary of major cation and anion analyses.
- Table 3.3 is a summary of miscellaneous analyses for various components, alkalinity, hardness, etc.
- Table 3.4 is a summary of asbestiform fiber analyses.

Raw analytical data from Energy Laboratories and EMS Laboratories used to prepare Tables 3.2, 3.3 and 3.4, are included in Appendix A and B, respectively.

Table 3.1. Field data summary.

SITE NO.	DESCRIPTION	pH (su)	EC (mmhos/cm)	TEMP (°C)	FLOW (cfs)
SW-1	Upper Rainy Creek above diversion dam	Not Sampled			
SW-2	Fleetwood Creek above coarse tails	8.76	0.41	15.4	0.02[1]
SW-3	Upper Carney Creek at Zook's Dump	Not Sampled			
SW-4	Lower Carney Creek above Rainy Creek	8.60	0.58	3.0	0.13[2]
SW-5	Tailings dam toe drains	7.21	0.53	4.1	0.64[2]
SW-6	Tailings pond outfall[5]	Not Sampled			
SW-7	Lower Rainy Creek leaving mine property	Not Sampled			
SW-8	Lower Rainy Creek above Kootenai River	8.48	0.44	3.2	.58[2]
SW-9	Kootenai River above Rainy Creek	Not Sampled[3]			
SW-10	Kootenai River below Rainy Creek	Not Sampled[3]			
SW-11[4]	Rainy Creek flow into tailings pond	8.29	0.33	10.3	0.02[1]
PW-1	Tailings Pond pore water	Not Sampled			
PW-2	Groundwater near SW-11	Not Sampled			

1 Flows were very small. Visual estimates were made.
2 Flow measurement was with a Pygmy current meter.
3 Samples of the Kootenai River were not taken as discussed in the Water Quality Monitoring Plan.
4 The original Water Quality Monitoring Plan did not include this site.
5 There was no surface flow from the impoundment.

Table 3.2. Laboratory data summary for major cations and anions.

SITE NO.	DESCRIPTION	K (mg/l)	Na (mg/l)	Ca (mg/l)	Mg (mg/l)	SO_4^{-2} (mg/l)	Cl^{-1} (mg/l)	CO_3^{-2} (mg/l)	HCO_3^{-1} (mg/l)
SW-1	Upper Rainy Creek above diversion dam	Not Sampled							
SW-2	Fleetwood Creek above coarse tails	Not Sampled							
SW-3	Upper Carney Creek at Zook's Dump	Not Sampled							
SW-4	Lower Carney Creek above Rainy Creek	13	9	103	30	21	3	NR	NR
SW-5	Tailings dam toe drains	11	6	94	25	7	6	NR	NR
SW-6	Tailings pond surface water	Not Sampled							
SW-7	Lower Rainy Creek leaving mine property	Not Sampled							
SW-8	Lower Rainy Creek above Kootenai River	9	7	84	20	11	9	NR	NR
SW-0	Blind Control (Replicate of SW-8)	9	6	83	20	15	9	NR	NR
SW-9	Kootenai River above Rainy Creek	Not Sampled							
SW-10	Kootenai River below Rainy Creek	Not Sampled							
SW-11	Rainy Creek flow into tailings pond	Not Sampled							
PW-1	Pore water from tailings	Not Sampled							
PW-2	Groundwater near SW-11	Not Sampled							

NR = Not reported. Laboratory report did not speciate carbonate forms.

Table 3.3. Laboratory data summary for miscellaneous constituents.

SITE NO.	DESCRIPTION	TDS (mg/l)	TSS (mg/l)	Hardness (mg/l)	Alkalinity (mg/l)	NO_3^{-1} (mg/l)	F^{-1} (mg/l)
SW-1	Upper Rainy Creek above diversion dam	Not Sampled					
SW-2	Fleetwood Creek above coarse tails	Not Sampled					
SW-3	Upper Carney Creek at Zook's Dump	Not Sampled					
SW-4	Lower Carney Creek above Rainy Creek	450	7	378	385	0.40	0.20
SW-5	Tailings dam toe drains	404	3	339	344	<0.05	2.40
SW-6	Tailings pond surface water	Not Sampled					
SW-7	Lower Rainy Creek leaving mine property	Not Sampled					
SW-8	Lower Rainy Creek above Kootenai River	350	5	292	286	0.07	1.18
SW-0	Blind Control (Replicate of SW-8)	351	<1	288	293	0.06	1.11
SW-9	Kootenai River above Rainy Creek	Not Sampled					
SW-10	Kootenai River below Rainy Creek	Not Sampled					
SW-11	Rainy Creek flow into tailings pond	Not Sampled					
PW-1	Pore water from tailings	Not Sampled					
PW-2	Groundwater near SW-11	Not Sampled					

Sept 1994

Table 3.4. Laboratory data summary for asbestiform fibers.

SITE NO.	DESCRIPTION	DETECTION LIMIT (MFL)*	FIBERS <5µm (MFL)*	FIBERS >5µm (MFL)*	FIBERS >10µm (MFL)*	FIBER MASS (µg/l)
SW-1	Upper Rainy Creek above diversion dam	Not Sampled				
SW-2	Fleetwood Creek above coarse tails	Not Sampled				
SW-3	Upper Carney Creek at Zook's Dump	Not Sampled				
SW-4	Lower Carney Creek above Rainy Creek	0.4	32.0	10.0	2.9	42
SW-5	Tailings dam toe drains	0.7	ND	ND	ND	ND
SW-6	Tailings pond surface water	Not Sampled				
SW-7	Lower Rainy Creek leaving mine property	Not Sampled				
SW-8	Lower Rainy Creek above Kootenai River	1.9	112.0	68.0	25.0	560
SW-0	Blind Control (Replicate of SW-8)	0.6	42.0	20.0	4.6	260
SW-9	Kootenai River above Rainy Creek	Not Sampled				
SW-10	Kootenai River below Rainy Creek	Not Sampled				
SW-11	Rainy Creek flow into tailings pond	Not Sampled				

* MFL = Million fibers per liter

4.0 DATA ANALYSIS

Data for streamflow, fluoride and asbestiform fibers collected during the last four base flow periods is compared in Table 4.1.

Stream flow data in Lower Rainy Creek continues to show a trend of slowly decreasing volume. Some of this volume decrease has been attributed to a reduction in hydrostatic head in the dam footings as pore water slowly drains from unflooded areas of the tailings impoundment. A decrease in flow from the toe drains of about 0.6 cfs has been observed. However, sample collection has been slightly earlier each year as well and this may also be a factor contributing to the trend of decreasing flows. On this latest site visit, very dry conditions prevailed. Flows into the tailings impoundment from Rainy Creek and Fleetwood Creek were only a trickle and were measured by visual estimate.

Initial trends for asbestiform fiber data in Lower Rainy Creek seemed to indicate a decrease in fiber counts since mine operation was ceased. However, the latest analyses in Lower Rainy Creek are higher (25.0 million fibers per liter (MFL) and 560 µg/l). However, a replicate sample was taken at this site and analyzed only 4.6 MFL and 260 mg/l. The 4.6 MFL value is within the requirements of the drinking water standard for asbestos (7.0 MFL) whereas the 25.0 MFL value is not. In the past, although asbestos analyses showed a lower level of reproducibility than other analyses based on the replicate samples, agreement between analyses was usually more consistent than this. Consequently, there is some concern that there is a sampling or analytical error with one of the two samples for asbestos from this site. The essential conclusions which have been drawn regarding asbestos fibers in Lower Rainy Creek remain unchanged:

- Lower Rainy is the area most likely to show the highest levels of asbestiform fibers. The reported values have varied quite a bit but are of the same order of magnitude as the drinking water standard.

- The source of the asbestos fibers is material already in the Lower Rainy Creek drainage. Historic mining practices are thought to be largely responsible for this since, at one time, tailings were discharged directly into the Rainy Creek drainage without settlement and impoundment.

- Considerable fluctuation in asbestos fiber analyses can be expected to continue depending on conditions of stream flow and streambank erosion.

Fluoride analyses in water from the toe drains (Site SW-5) had been steadily declining until this last sampling event. The latest value at SW-5 is 2.4 mg/l F, up from 1.5 mg/l in 1993. However, fluoride in Lower Rainy Creek was only 1.18 mg/l F, slightly lower than reported on earlier sampling dates. These values are near the expected value for saturation with CaF_2. Since the new drinking water standard for fluoride is set at 4.0 mg/l F, it is unlikely that this standard will be exceeded as long as there is a significant concentration of calcium in the waters sampled.

5.0 REFERENCES

American Public Health Association, 1985. Standard Methods for the Examination of Water and Wastewater, Part 300: Determination of Metals.

Schafer and Associates, 1991. W.R. Grace Vermiculite Mine Closure Water Quality Monitoring Plan, submitted to Montana Department of Health and Environmental Sciences, Water Quality Bureau.

Schafer and Associates, 1992(a). W.R. Grace Vermiculite Mine Closure Water Quality Data Report No. 1, November 1991, submitted to Montana Department of State Lands, Hard Rock Mining Bureau.

Schafer and Associates, 1992(b). W.R. Grace Vermiculite Mine Closure Water Quality Data Report No. 2, March 1992, submitted to Montana Department of State Lands, Hard Rock Mining Bureau.

Schafer and Associates, 1992(c). W.R. Grace Vermiculite Mine Closure Water Quality Data Report No. 3, July 1992, submitted to Montana Department of State Lands, Hard Rock Mining Bureau.

Schafer and Associates, 1993. W.R. Grace Vermiculite Mine Closure Water Quality Data Report No. 4, October 1992, submitted to Montana Department of State Lands, Hard Rock Mining Bureau.

Schafer and Associates, 1994. W.R. Grace Vermiculite Mine Closure Water Quality Data Report No. 5, October 1993, submitted to Montana Department of State Lands, Hard Rock Mining Bureau.